Acoustically-induced Capillary Waves on Bubbles and Shells: Pattern Formation and Turbulence. R. GLYNN HOLT, EUGENE H. TRINH, Jet Propulsion Laboratory, California Institute of Technology --- Capillary waves are often observed on the surface of acoustically levitated drops, bubbles and shells. We have investigated the phenomenon of such waves on acoustically levitated bubbles in water and shells in air. Via video and light scattering we have established that the mechanism for converting the acoustic energy into wave motion is the Faraday instability. Measurements of pattern formation, fluctuation and transition will be presented, as well as investigations of temporal dynamics. In particular, the transition to spatiotemporal chaos and/or turbulence is investigated. The shell is the primary "laboratory" for turbulence, since, for certain wall thicknesses and levitation pressures, the entire surface becomes covered with apparently turbulent capillary waves, accompanied by a reduction of the gravity-induced pooling, A power-law ($\omega^{-2.59}$) decay of the temporal spectrum is observed in the turbulent regime. [Work supported by NASA]